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The Effect of the Collaborative Infertility Counseling Model on Coping Strategies in Infertile Women Undergoing In Vitro Fertilization: a Randomized Controlled Trial

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Abstract

Objectives: Infertility is a stressful condition influencing interpersonal and social relationships among infertile couples. Various strategies have been suggested for coping with infertility. This study examined the effect of the collaborative infertility counseling model on coping strategies in infertile women undergoing in vitro fertilization (IVF) in an urban area of Iran.

Materials and Methods: This clinical controlled trial was conducted on 60 women with primary infertility selected from Milad Infertility Center in Mashhad, Iran. They were randomly allocated to the intervention and control groups with 29 and 31 samples in each group. The intervention group received individual counseling based on the collaborative reproductive healthcare model. The counseling was provided with the collaboration of a midwife, a gynecologist and a clinical psychologist in 5 sessions during a 2-month period. The control group received only routine care. The fertility problem inventory (FPI) and general health questionnaire were used to measure perceived fertility-related stress and general health, respectively. Moreover, the ways of coping-revised questionnaire was used to collect data regarding the women's coping strategies at the beginning of the study and at the day of the embryo transfer. The student *t* test, Fisher exact test, Mann-Whitney U test and analysis of variance (ANOVA) were used for data analysis.

Results: A statistically significant difference was reported between the two groups in terms of problem-focused coping strategies ($P=0.037$). However, no statistically significant difference was reported between the groups with regard to emotion-focused coping strategies ($P=0.947$). There were statistically significant differences between the 2 groups in the mean scores of seeking social support ($P=0.022$) and planful problem-solving strategies ($P=0.045$) as the subscales of problem-focused coping strategies.

Conclusion: The collaborative reproductive healthcare model promoted the use of problem-focused coping strategies. Therefore, the use of collaborative counseling approaches by healthcare professionals is suggested for assisting infertile women to cope with infertility.

Keywords: Infertility, Collaborative infertility counseling model, Coping strategies, In vitro fertilization

Introduction

Infertility is considered as a stressful experience and a potential threat to the individual, marital and social stability in all societies (1,2). The World Health Organization (WHO) has identified infertility as a public health concern across the globe (3). Accordingly, it is estimated that 80 to 168 million people across the world are affected by infertility (1). Approximately 25% of Iranian couples may also experience primary infertility in their life (4,5).

Psychological reactions such as stress, anxiety, depression, loss of control, guilt and sexual issues may be observed in infertile couples (1,6-8). Despite the experience of stress and anxiety by infertile couples, the development of new methods for the treatment of infertility such as in vitro fertilization (IVF) has raised hope among couples (1,9,10).

Coping strategies are helpful methods for stress management. Coping is defined as changing stressful situations (a problem-focused approach) and efforts for the regulation of emotional outcomes related to the situation (an emotional-focused approach) (11). The use of coping strategies depends on situational (controllability and variability) and individual factors (resources and self-confidence). The problem-focused coping approach reduces psychological distress and increases the quality of life in infertile couples (1,12-16). It has been shown that infertile women often employ multiple coping strategies instead of a single method to cope with this stressful condition (17). Moreover, the infertility counseling strategy combines the medical and psychological aspects of reproductive health (1,17,18). Infertility counselors try to adopt holistic approaches to prepare couples for confronting with this stressful life event with the

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consideration of the couples' socio-cultural concerns (19). Furthermore, a multidisciplinary team consisting of doctors, midwives, nurses, psychologists and counsellors, fertility clinic managers, and chaplains provides psychosocial support to infertile women (20). Therefore, Covington and Hammer Burns introduced a theoretical framework known as the collaborative reproductive healthcare model based on the bio-psychosocial model. In this model, all physiological, psychological, personal and social aspects of infertile individuals are taken into consideration. In the collaborative reproductive healthcare model, physicians, psychiatrists, midwives and gynecologists develop a healthcare team, which accompanies infertile couples from the beginning of the treatment process to its end (1,21). Latifnejad Roudsari et al reported that the collaborative counseling model decreased the infertile women's perceived infertility-related stress. Therefore, it was suggested as a useful strategy for stress management in infertile women undergoing IVF (20).

There were a limited number of studies and controversial findings about the effects of the collaborative infertility counseling model on the application of coping strategies in infertile women. Therefore, this study was conducted to investigate the effect of the collaborative infertility counseling model on coping strategies in infertile women undergoing IVF in an urban area of Iran.

Materials and Methods

Design and Participants

This clinical controlled trial (http://irct.ir, identifier IRCT201110267915N1) was conducted on 60 women aged 20 to 45 years with primary infertility selected from an infertility research center. The study setting was a public referral infertility research and treatment center affiliated with Mashhad University of Medical Sciences, Khorasan province, Iran. This referral center admitted clients from other eastern provinces of Iran.

Sampling

The samples were recruited using random allocation method. The inclusion criteria were as follows: having Iranian nationality; being literate and speaking in Farsi; not having received the oocyte donation; not being a gestational surrogate; having no history of somatic or psychiatric problems; having no smoking habits and having achieved the score of <28 from the general health questionnaire (GHQ-28). The exclusion criteria were a lack of response to the treatment; leaving the treatment for any reason and the experience of severe family conflicts or psychologically traumatic events.

Those women who met the above-mentioned inclusion criteria were randomly allocated into the intervention and control groups through tossing coins.

A pilot study was conducted to determine the sample size. Therefore, data was collected from the first ten women in each group and analyzed. Accordingly, given the 0.95 CI and power of 0.80, the sample size was determined 28 patients in each intervention and control groups. However, to compensate for probable attritions 40 women in each group were recruited. Therefore, 115 women were evaluated with regard to being eligible for participation in this study. Accordingly, 32 women were excluded based on the inclusion criteria and 5 others declined to participate in this study. Lastly, 29 and 31 women were randomly allocated into the intervention and control groups, respectively (Figure 1).

Measurements

The self-administered questionnaire used for data collection in this study included the demographic data form with questions about individual and family characteristics, infertility-related and psychological data on counseling sessions and relaxation techniques. In addition, coping strategies were evaluated using the ways of coping-revised (WOC-R) questionnaire. The fertility problem inventory (FPI) and GHQ-28 were also used for data collection regarding perceived fertility-related stress and general health, respectively (22)

The WOC-R questionnaire consisted of 50 items and 8 subscales, which were graded by a 4-point Likert scale. The items were rated on a 4-point response scale (0 = no use to 3 = many uses). This WOC-R questionnaire was divided into problem-focused and emotion-focused coping strategies. The problem-focused coping strategy was consisted of 4 subscales including accepting the responsibility, seeking social support, planful problem solving and positive reappraisal. The emotional-focused coping strategy included 4 subscales such as confrontive coping, escape/avoidance, self-controlling and distancing. The minimum and maximum scores for the problem-focused and emotional-focused coping were 0-69 and 0-81, respectively (23). The face and content validity of the WOC-R, FPI and GHQ-28 were assessed through seeking the opinions of experts in the field of obstetrics, gynecology and infertility. The reliability of the above-mentioned questionnaires was also sought through the measurement of internal consistency using Cronbach α coefficients that were 0.8, 0.91 and 0.92, respectively.

Procedure

The researchers identified the subjects with the inclusion criteria at initial stage of the IVF procedure (basic sonography on second and third days of menstrual cycle) in Montaserieh clinic. All of the subjects have completed the study instruments at the beginning of the study. Then, all of them completed the WOC again at the end of the study (i.e. after 8-9 weeks). During the study, the control group received routine care. However, in addition to the routine care, the intervention group received 5 sessions of individual counseling program regarding the nature of infertility, its causes and treatments, proper

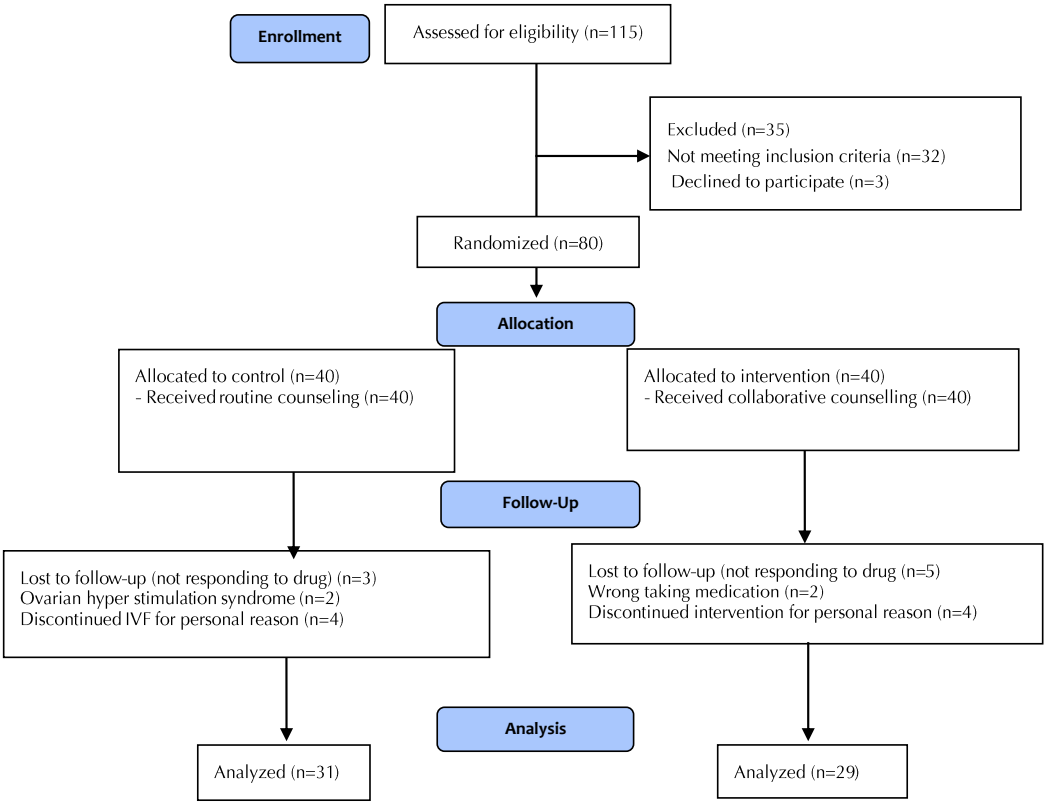

Figure 1. Consort Flow Diagram of the Study.

communication, problem-focused coping strategies and stress management techniques (i.e. the Jacobson relaxation technique to be practiced at least 5 times a week). The counseling program was conducted in the presence of a midwife (the first author), a gynecologist and a clinical psychologist. Each session lasted for 45 to 60 minutes, and was held during IVF treatment cycle that lasted between 8 to 9 weeks. Every session consisted of a combination of a short speech, question and answering, and role playing. At the end of the first session, an audio CD, an educational pamphlet about the relaxation techniques, and a checklist to record the frequency of relaxation techniques at home were given to each subject. The content validity of the educational pamphlet and the audio CD was confirmed by the faculty members in Mashhad University of medical sciences. The structure of the collaborative counseling sessions is presented in Table 1.

Between the sessions, the main researcher remained in contact with the subjects to remind them of the meetings and coordinate the sessions. The subjects were asked to inform the researcher in case any problems occurred. Finally, a post-test was performed at the end of the fifth session and after embryo transfer procedure, using the WOC questionnaire.

Data Analysis

Descriptive and inferential tests were used for data analysis via the SPSS version 11.0 software (SPSS, Inc. Chicago, Illinois, and USA). The Kolmogorov-Smirnov test was used to assess the normal distribution of data for quantitative variables. The student *t* test, Fisher exact test and Mann-Whitney U test were also used to cheek the homogeneity of the two groups in terms of demographic and basic variables. The differences between the groups were analyzed using the independent *t* test and paired *t* test. Moreover, the analysis of variance (ANOVA) test was applied to evaluate the effect of confounding variables. *P* value ≤0.05 was considered statistically significant.

Results

We found that the 2 groups had no statistically significant differences in terms of demographic characteristics such as age ($P=0.085$), the educational status ($P=0.056$), partner's education ($P=0.256$), occupational status ($P=0.204$), place of residence ($P=0.203$), duration of marriage ($P=0.457$) and family composition ($P=1.00$). Table 1 shows the infertility-related and psychological data of the women participated in this study.

At the beginning of the study, no statistically significant difference was found between the two groups in terms of the problem-focused coping strategies ($P=0.096$). However, after the procedure, a statistically significant difference was found between the two groups in the mean scores of the problem-focused coping strategies ($P=0.037$) (Table 2). According to Table 2, after the intervention, no statistically significant difference was

Table 1. The Outline of the Counseling Sessions

Purpose	The Time and the Facilitator	Content
Providing information about infertility, identifying the irrational beliefs about infertility. Presenting the Jacobson relaxation technique	Conducted by a midwife, on days 2 and 3 of the first cycle.	Greeting, introducing the session's facilitator and the patient to each other, correcting the false beliefs and encouraging the subjects to talk about their feelings and concerns about infertility and its treatment, presenting the Jacobson relaxation technique and its effects on improvement of the treatment outcomes; practicing the Jacobson relaxation technique, giving the subjects an audio CD and an educational pamphlet about the relaxation techniques and a checklist to record the frequency of relaxation techniques at home.
Psychological counseling.	Conducted by a psychologist and a midwife, around days 19-20 of the first cycle after performing sonography.	Greeting, introducing the session's facilitator and the patient to each other, reviewing the content of the previous session and the way of doing exercises at home; the psychologist encouraged the subjects to talk about her interactions with their spouse, family and community, and also about their thoughts and feelings about infertility, counseling and discussions were conducted on the list of the subjects irrational beliefs and negative thoughts and beliefs in marital life.
Counseling about coping strategies in stressful situations.	Conducted by a psychologist and midwife, on the second day of the next cycle (approximately 10 days after the second session).	Reviewing the content of the previous session and the way the subjects practiced them; the psychologist helped women to find an effective support system and offered them effective coping strategies in relation to their infertility -related issues.
Reviewing the problem-based coping strategies in relation to infertility, and the efficient communicative skills and stress reduction techniques.	Conducted by a midwife, on days 6-8 of the second cycle (approximately one week after the third session).	Greeting, receiving feedback from the subjects about the content of the earlier sessions and train them how to generalize those to their real life; discussing on the role of efficient communication in stress reduction; presenting the principles of effective communication and the aftermaths of poor communication; discussion on problem- based coping strategies in relation to infertility.
Describing the oocyte retrieval and embryo transfer procedures, doing Jacobson relaxation technique.	Conducted by a gynecologist and the midwife, on day 14 of the second cycle.	Describing the oocyte retrieval and embryo transfer procedures, answering the eventual questions of the subjects by the gynecologist; practicing the relaxation techniques.

observed between the groups in terms of the use of the problem-focused coping strategies ($P=0.621$, $P=0.954$). The mean difference between the two groups with respect to the problem-focused coping strategies had also no statistically significant difference ($P=0.702$) (Table 2).

No statistically significant difference was found between the 2 groups in terms of the subscales of problem-focused coping strategies such as seeking social support ($P=0.140$), positive reappraisal ($P=0.813$), planful problem-solving ($P=0.984$) and accepting responsibility ($P=0.108$) before the intervention. However, after the intervention, seeking social support ($P=0.022$) and planful problem-solving ($P=0.045$) significantly improved, but accepting responsibility reduced in the intervention group ($P=0.016$).

According to Table 3, despite the noticeable reduction in the use of the emotion-focused coping strategies after the intervention, no statistically significant difference was reported in the mean scores ($P=0.269$) (Table 3). No statistically significant differences were observed between the 2 groups regarding confrontive coping ($P=0.451$), distancing ($P=0.162$), escape/avoidance ($P=0.225$) and self-control ($P=0.910$). However, in the intervention group, a statistically significant decrease was reported in the escape/avoidance coping strategy ($P=0.029$) (Tables 4 and 5).

Discussion

In this trial, we examined the effect of the collaborative infertility counseling model on coping strategies in infertile women undergoing IVF in an urban area of Iran.

According to our findings, the difference in the mean scores of the problem-focused coping strategies between the groups was not statistically significant, though the mean difference after the intervention was significant. Gurhan et al and Van Zyle et al provided the counseling program to infertile women undergoing IVF and reported no improvements in the use of the problem-focused coping strategies (24,25). Karlsen et al also used a group counseling method to educate women with diabetes and found no statistically significant difference between the groups in the application of the problem-focused coping strategies (26).

Regarding the subscales of the problem-focused coping strategies, a significant increase was reported in the planful problem-solving and seeking social support in the intervention group. As reported by Van Zyle et al, the functional performance as a subscale of the Aldwin's coping strategies scale had a statistically significant increase after the implementation of counseling in infertile women undergoing counseling, but no changes were reported in the other subscales of the problem-focused strategies (25).

Karlsen et al used a researcher-made questionnaire

Table 2. Characteristics of the Subjects in 2 Groups (n = 60)[a]

Variable	Control	Intervention	*P* Value
Age, y			0.169 [d]
20-24	4 (12.9)	3 (10.3)	
25-29	17 (54.8)	11 (37.9)	
30-34	8 (25.8)	7 (24.1)	
35-40	2 (6.5)	8 (27.6)	
Education			
Elementary	8 (25.8)	4 (13.8)	0.109 [d]
High school	6 (19.4)	1 (3.4)	
Diploma	11 (35.5)	15 (51.7)	
Collegiate	6 (19.4)	9 (31.0)	
Infertility related data			
Awareness of diagnosis, mon	6.08 ± 4.31	5.62 ± 4.26	0.682 [b]
Duration of treatment, mon	4.03 ± 4.24	3.83 ± 3.97	0.935 [c]
Number of IUI cycles	1.16 ± 1.43	1.34 ± 1.34	0.495 [c]
Number of IVF cycles	0.32 ± 0.54	0.44 ± 1.18	0.550 [c]
Cause of infertility			0.597 [c]
Male	16 (51.6)	10 (34.5)	
Female	8 (25.8)	9 (31.0)	
Both spouses	3 (9.7)	4 (13.8)	
Unknown	4 (12.9)	6 (20.7)	
Hope for treatment success			0.173 [d]
Very high	10 (34.5)	9 (31)	
High	9 (31.0)	12 (41)	
Somewhat	4 (13.8)	4 (13.8)	
Low	6 (20.7)	4 (13.8)	
Parties participated in the treatment			0.359 [d]
Male	3 (9.7)	1 (3.4)	
Female	0	2 (6.9)	
Both spouses	28 (90.3)	26 (89.7)	
Psychological data			
Infertility stress score (FPI)	163.51 ± 28.30	153.62 ± 26.80	0.170 [b]
General health score (GHQ)	19.45 ± 6.15	20.03 ± 6.27	0.718 [b]
Feeling about infertility			0.462 [d]
Shook	0	1 (3.4)	
Deny	0	1 (3.4)	
Grief, anger, guilt, anxiety,	18 (58.1)	18 (62.1)	
Acceptance	13 (41.9)	9 (31)	

IVF: in vitro fertilization; IUI: intra uterine insemination.
[a] Data are presented as No. (%) or mean ± SD; [b] Independent sample *t* test; [c] Mann-Whitney; [d] Chi-square.

based on the Lazarus and Folkman's questionnaire, which included social support, seeking information and planning. Although an increase was observed in the use of the problem-focused strategies, no significant difference was found between the two groups in other subscales (26).

In the present study, a statistically significant difference between the 2 groups was observed in the mean scores of social support at the end of the study. This finding was similar to that reported by Van Zyle et al and Karlsen et al (25,26). Overall, if social support denoted information seeking, it was regarded as a problem-focused coping strategy, whereas if it referred to seeking emotional support, it was interpreted as an emotion-focused coping strategy. In the present study, seeking social support indicated information seeking. Therefore, given the content of counseling sessions, the increased social support in the intervention group could be justified.

With regard to accepting responsibility, no statistically significant difference was reported in the mean scores of the two groups. However, the Wilcoxon test results showed a decrease in accepting responsibility in the intervention group at the end of the study. Similarly, Karlsen et al reported that counseling reduced self-blame in the intervention group (26). However, in the study of Karlsen et al, self-blame was studied as a separate subset without being categorized as a problem-focused or emotion-focused strategy, and included phrases similar to the Lazarus and Folkman's questionnaire. This subscale contained phrases which indicated one's acceptance of responsibility for causing the problem and rectifying it.

Iranian infertile women suffer from the emotional consequences of infertility more than men. Several studies have indicated that females experience more stress than males (1,24). However, after the determination of the role of men in infertility via diagnostic procedures and undergoing related treatments, the burden of infertility on women may be reduced.

The collaborative counseling in this study provided the couples with information to understand their problems. Such information may have contributed to the reduction of accepting responsibility in the intervention group. The mean difference between the 2 groups was not significantly different in terms of the planful problem-solving strategy, whereas, significant differences between the two groups were reported after the intervention.

Similarly, Karlsen et al and Tarabusi et al reported that the intervention and control groups had no differences

Table 3. Differences in the Mean Scores of Problem-focused Coping Strategies Between the 2 Groups

		Group		*t* test		Lower Limit-Upper Limit
		Control Mean (SD)	Intervention Mean (SD)			
Problem focused strategies	Pretest	29.8±9.9	34.0±9.4	*df* = 58, t=-1.6	*P* = 0.096	-5.170 (-10.014 to -0.325)
	Posttest	29.0±10.4	34.1±8.1	*df* = 58, t=-2.1	*P* = 0.037	
	Mean difference	0.8±9.4	-0.1±9.6	*df* = 58, t=0.3	*P* = 0.702	
Paired *t* test		*P* = 0.621, *df* = 30, t=0.4	*P* = 0.954, *df* = 28, t=-0.5			

Table 4. Differences in the Mean Scores of Emotion-Focused Coping Strategies Between the 2 Groups

		Group		*t* test		Lower Limit-Upper Limit
		Control Mean (SD)	Intervention Mean (SD)			
Emotional focused strategies	Pretest	30.4±8.2	33.4±9.2	*df* = 58, t=-1.3	*P* = 0.187	-.0180 (-5.543to5.182)
	Posttest	29.6±10.1	29.8±10.6	*df* = 58, t=-.06	*P* = 0.947	
	Mean difference	0.8±7.8	3.6±11.5	*df* = 58, t=-1.1	*P* = 0.269	
Paired *t* test		*P* = 0.621, *df* = 30, *t*=0.4	*P* = 0.954, *df* = 28, *t*=-0.5			

Table 5. Differences in the Mean Scores of 8 Subscales of Coping Strategies Between the 2 Groups

	Intervention		Control		Test	Lower Limit-Upper Limit
	Pre	Post	Pre	Post		
Problem-focused coping						
Positive reappraisal	8.5±3.3	8.8±2.7	6.9±2.9	7.2±3.4	*P* = 0.123, *df* = 58, t=-1.5	-3.225 to -0.037
Seeking social support	9.2±3.4	10.1±3.4	8.5±3.9	7.9±3.9	*P* = 0.022, *df* = 58 t=-2.3	-4.133 to -0.331
Accept responsibility	4.4±2.4	3.5±2.2	3.7±2.1	3.6±1.8	*P* = 0.804, *df* = 58, t=-0.2	-0.914 to 1.176
Planful problem solving	8.5±3.3	8.8±2.7	6.9±2.9	7.2±3.4	*P* = 0.045, *df* = 58, t=-2	-3.225 to -0.037
Emotional-focused coping						
Confrontive	7.1±3.5	6.4±3.2	5.3±2.1	5.2±2.5	*P* = 0.125, *df* = 58, t=-1.5	-1.153 (-2.638 to 0.331)
Self -controlling	9.0±3.4	8.6±3.4	9.0±3.1	8.6±3.9	*P* = 0.994, *df* = 58 t=-.008	-.007 (-1.0921 to 1.905)
Escape- avoidance	9.4±3.9	7.8±3.7	9.4±3.4	8.8±3.8	*P* = 0.293, *df* = 58, t=1.06	1.013 (-0.899 to 2.926)
Distancing	7.9±2.5	7.0±3.3	6.6±3.0	7.0±2.6	*P* = 0.899, z=0.1	-1.259 (-2.700 to 0.202)

in the planning and active coping subscales (26,27). However, Fife et al reported a significant increase in the use of active coping in the intervention group. They investigated the effects of the mental education program on the improvement of active coping in patients with HIV. Although infection and infertility were both associated with severe stress, coping strategies in these patients varied to some extent. In the study of Fife et al the subjects' partners were also included and attended the intervention sessions. Therefore, the results of the analysis of covariance showed significant differences between the groups in terms of the active coping strategies, which could be somehow justified by positive changes in the behavior of the subjects' partners (28).

In the present study, no statistically significant difference was found between the 2 groups regarding positive reappraisal. The findings of the study done by Fife et al were in consistence with our findings. The mean difference between the 2 groups was not statistically significant in terms of the emotion-focused coping strategies. This finding is congruent with the findings of the studies conducted by Karlsen et al and Gurhan et al in which no statistically significant difference was found between intervention and control groups (24,26).

In this study, despite the decline in the use of the confrontive coping strategy in both the groups, they had no statistically significant differences. According to a study done by Lee), no significant differences between the two groups were found. However, in the above-mentioned study, significant differences between the 2 groups in terms of confrontational problems and mind-body relaxation in some stages of IVF were found. In the study of Lee, the maximum use of the confrontational coping and relaxation techniques was reported at the beginning of the treatment and during the embryo transfer period, respectively (7). It should be noted that Lee applied the Jalowiec coping scale that was different from the Lazarus and Folkman's questionnaire. In fact, in the study conducted by Lee, the Jalowiec scale consisted of the problem-focused and emotion-focused coping strategies that increased the use of coping strategies by each group.

The findings of this study showed no statistically significant difference between the 2 groups in terms of the distancing coping strategy ($P=0.899$). Similarly, in the studies done by Van Zyle et al and Karlsen et al, no statistically significant differences were reported between the 2 groups in terms of the under estimation, self-blame or avoidance strategies (25,26). In the present study, there was no statistically significant difference between the groups in self-control ($P=0.910$). No similar study was found that measured the effect of psychological interventions on the self-control coping strategy.

In this study, no statistically significant differences were found between the 2 groups in the mean scores of the escape/avoidance coping strategy. However, a significant decrease in the use of escape/avoidance coping strategies was reported in the intervention group. On the contrary, in the studies conducted by Van Zyle et al and Tarabusi et al, no statistically significant differences were reported in terms of the escape from stressors or avoidance coping strategy (25,27). In the present study, the women used the escape/avoidance coping strategy less frequently due

to participation in the counseling sessions, involvement in the treatment process and familiarity with the coping strategies.

It is worth mentioning that in studies discussing coping strategies, circumstances and personal factors are important and a specific coping strategy can lead to different outcomes in different situations. This may in fact be the cause for inconsistency in the results reported by many studies examining the relationship between stresses and coping strategies. Studies have shown that individual's ability to control stress affects the method of stress management. In the present study, a post-test was performed after the embryo transfer. The ineffectiveness of collaborative counseling in the use of the problem-focused coping strategies could be due to the period after the embryo transfer (7) and that infertile women felt fertilized and evaluated the situation as uncontrollable. Therefore, individuals less frequently applied the problem-focused strategies in uncontrollable situations (11).

As Gurhun et al reported, infertility was a stressful event and IVF was perceived as a positive challenge with positive effects on infertile women (24). Before the intervention, the women in the two groups used positive reappraisal more than other coping strategies. This indicated that the infertile women who accepted costly and painful treatments and participated in the counseling sessions, sought treatment and planned for actively changing their current status (24).

Although the collaborative counseling strategy probably might have long-term effects, such effects were not evaluated in this study. Despite the efforts of the researchers to eliminate or control confounding variables regarding coping strategies, personal differences, subjects' psychological characteristics, behavioral differences among the gynecologist, midwife and other members of the treatment team in contact with infertile women during the procedures of ultrasonography, egg retrieval and embryo transfer could not be controlled. However, to our knowledge, this is the first study that applied a collaborative counseling strategy in infertile women undergoing IVF using the collaborative reproductive healthcare model adopted from the theoretical framework of Covington and Hammer Burns (1).

Conclusion

Given the significant difference between the two groups in terms of the two subscales of problem-focused coping strategies including seeking social support and planful problem-solving, the use of collaborative counseling approaches by healthcare professionals is suggested for assisting infertile women to cope with infertility.

Conflict of interest

No conflict of interest is declared by the authors.

Ethical Issues

This trial conformed to the principles outlined by the Declaration of Helsinki, 1995, revised in 2001. This research protocol was also approved by the ethics committee affiliated to the Mashhad University of Medical Sciences (No. 1388/511). Furthermore, permission was obtained from authorities to enter the research zone. The women were informed of the aim and process of this study. They were informed that participation in this study was voluntary and they could withdraw from this study at any time without being penalized. Those women who agreed to willingly take part in this research project, signed the written informed consent.

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